Incorporating "The Illuminating Engineer."

Light and Lighting

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The Nations Confer —on Illumination

IN these troublous times, when the very word "international" has become associated with disputes and alarms, it is comforting to reflect that in the world of science profitable conversations between representatives of different nations are still possible.

We give elsewhere some account of the Tenth Session of the International Illumination Commission, which took place in Holland during June 12th to 20th. Some 450 visitors from 14 different countries met to discuss problems associated with photometry and illumination, set out under 24 main headings.

The gathering has served its purpose once more in enabling decisions to be taken on many technical points and in providing a clearing house for information from all parts of the world.

Even more important was the demonstration that it is still possible for men of different nations to meet in concord, confer in amity, and depart in peace.

Lectures on Illuminating Engineering

We are interested to hear that the Northampton Polytechnic are continuing their evening classes in "The Principles and Practice of Illuminating Engineering," which are designed to cover the syllabuses of the City and Guilds of London Institute's examinations. It is most important that there should be available courses for this purpose, and the Polytechnic deserve great credit for their perseverance in this field. We understand that another course of lectures on illumination, of a somewhat more general and popular character, and to commence in January next, is being planned by the Borough Polytechnic. Announcements of both series of lectures will appear in due course. We hope that the leading firms in the lighting industry will support them and encourage the younger members of their staffs to attend. For the future of illuminating engineering as a profession it is most vital that examinations and courses of instruction should become firmly established. It is naturally not always easy to make an immediate success of courses intended for what is, even to-day, a new profession. But we are confident that recognition of the value of the services of experts on lighting will develop and the demand for education in this field will steadily grow.

N.P.L.: Annual Visit

The National Physical Laboratory was favoured by fine weather for the annual visit on June 27, and there was, as usual, a notable assembly of scientists and engineers. The programme of the laboratory now covers such a very wide field, ranging from the testing of milk to the study of aerodynamics, that there is something to interest everyone. The pleasant surroundings of Bushy House also serve as an attraction, whilst journeys from one laboratory to another may now be broken by visits to a model air raid shelter, from which the heads of venerable scientists popped out unexpectedly. Visitors were interested in the demonstration, in the experimental lighting building, of methods of testing access of light into interiors, by means of a model exposed to an artificial sky. Photoelectric methods have evidently simplified this process considerably, and likewise the photometric determination of daylight factors. In the field of photometry matters have been much improved by the fine new building, which was visited by members of the Illuminating Engineering Society on its completion a few years ago. There were on view many demonstrations illustrating routine work, such as life tests of electric lamps, and numerous forms of specialised apparatus such as spectrophotometers, telephotometers, etc. There was some inquiry for the new primary standard of light based on the brightness of molten platinum, on which the international candlepower will be based from 1940 onwards. Filament standards will no doubt ensure the preservation of the new unit, but the "outward and visible sign," the equipment for the standard itself, was not in evidence, though doubtless it will be reassembled in the near future.

Testing Luminescent Materials

One of the most captivating demonstrations was that relating to the testing of luminescent materials. Such tests impose special difficulties, by reason of the wide range of colour and the low brightness often encountered. This is evidently a most fruitful field for research. There are many questions involved, to which one cannot readily supply an answer. In the case of a fluorescing material, for example, what is the relation between stimulus and response? We gathered that within limits the relation is approximately linear—but does the brightness go on increasing indefinitely with increasing stimulation, or is there ultimately a saturation limit? Even more interesting are the queries one would like answered in connection with phosphorescence. There has been great improvement in such materials. It is said to be feasible to produce a luminous sign which, after stimulation, will preserve a useful degree of brightness after ten or twelve hours. But what determines the "storage power" of the material? How far can the duration of the brightness be improved by intense stimulation with ultraviolet light? Does this ultimate brightness depend on the duration of the exposure as well as the intensity? How can one establish standards of stimulus, taking into consideration both the intensity of the source and the quality of the radiation? Must one resign oneself to the characteristic curve of decay of brightness—or can one modify it by selection of material or nature of stimulus so as to get a lower initial brightness but a better ultimate value? All these are searching questions to which an answer must be provided before we can approach the ideal economic basis of artificial illumination—a frieze or wallpaper which receives radiation from the sun by day and gives it out again to an "adequate and suitable" extent by night?

I.I.C. Congress in Holland

A view of the Palace Hotel, Scheveningen, the headquarters of the Congress. At the time of the gathering the beach was, however, comparatively deserted. The season had not yet opened and the weather was hardly warm enough for sun-basking in the attractive beehive chairs on the sands.

On pp. 145-150 will be found a special article reviewing events at the recent I.I.C. Congress, which took place in Holland last month. In these notes it is only desired to record one or two salient features, amongst which the very friendly welcome of our Dutch hosts deserves special mention, and likewise the smooth and efficient working of the Bureau at the Palace Hotel. The organisation of the various social features was excellent. The programmes of the various sessions went through slickly, a high standard of punctuality in commencing proceedings being generally preserved. A dominant recollection of these meetings is the linguistic facility and inexhaustible vitality of Dr. N. A. Halbertsma, whose famous lightning summaries of contributions, in three languages, were once more the subject of general admiration. Attractive social events kept the evenings well occupied. On few occasions only did one return to one's hotel before midnight, and even then there was an evident general inclination to keep things going until 2 a.m.

Science and Salesmanship

The sessions covered a very wide field, some of the topics being highly technical and others general in scope. Whilst, no doubt, the most valuable work was done in such sections as those concerned with photometry and aviation lighting, the opportunities for intercourse in connection with lighting problems generally was appreciated. This is the only real opportunity for international discussions, at four-yearly intervals, on illuminating engineering. It is well, therefore, that the plan of subjects should be a broad one. Having said this one may perhaps also admit that on certain occasions there was a rather odd mixture of "science and salesmanship." In the discussion on lighting education, for example, there was practically no opportunity for discussing the important and difficult tasks of framing examinations in illuminating engineering or establishing courses of lectures in schools and colleges. "Lighting education" was visualised in terms of propaganda to the general public—and resultant success in inducing them to purchase lamps and lighting equipment. We would not say that this is an unworthy topic for discussion at an international conference—it was evident, indeed, that it appealed quite strongly to a considerable part of the audience. But it would seem better to recognise this frankly by allotting a special session to such matters (in somewhat the same way as the American I.E.S. provides a definite opportunity for sales discussions independent of the technical sessions at their annual conventions) and to restrict the Lighting Education session to material associated with education in its correct sense.

Standardisation—a Vital Process

At the recent annual meeting of the British Standards Institution the Rt. Hon. R. S. Hudson, M.P., Parliamentary Secretary to the Department of Overseas Trade, proposed the toast of the Association. He quoted, very appropriately, the instructions issued in 1660 to the Council of Trade (the forerunner of the Board of Trade) requiring them to consider by what means manufactures "may be restored and maintained in their ancyent goodnesse and reputacion" so as not to "destroy ye Creditt of the Commodity and thereby render it neglected and unvended abroad, to ye great loss and scandall of these our Kingdoms." He emphasised that standardisation helps to reduce costs and foster co-operation between manufacturers and consumers, and to solve the problem of making available stocks of spare parts.

Sodium Lighting in Paignton

We reproduce above a view of the sodium lighting in Paignton, which delegates to the recent I.M.E.A. Convention had an opportunity of seeing. We understand that the particulars recently given in a note on this subject (June, 1939, p. 121) were not quite correct, and that the installation consists of fifty-one "Philora" 140-watt sodium lamps in "Bi-Multi" reflector units, made by the Electric Street Lighting Apparatus Company of Canterbury. The units are spaced 130 ft. to 160 ft. apart, and are mounted 23 ft. to 25 ft. high, on one side only of the road, which is 22 ft. to 28 ft. wide. The L.T. distribution poles are used for one part of the section, tramway poles being utilised for the remainder.

Can Illuminated Signs be Decorative?

A summary of a Discussion at the Joint Meeting of the Decorative Lighting and Commercial Lighting Sections of the Illuminating Engineering Society on March 28, 1939.

The discussion which took place at the joint meeting of the Commercial and Decorative Lighting Sections on March 28 was of a lively character.

Mr. A. W. BEUTTELL, who presided, opened the proceedings by remarking that illuminated signs were both popular—in the sense that there were a great many in use—and unpopular—because many believed them to be to some extent disfiguring. Some, like traffic and direction signs, might be classed as a necessity. Others, whilst thrust upon the public in order to advertise something, yet fulfilled the need of industry to acquaint the public with its wares.

The object of the meeting was to bring about co-operation on the part of the chief interested parties, who would be represented in the discussion by four speakers: Mr. John Langdon (Secretary of the Master Sign Makers' Association), Mr. C. J. Rose (President of the Incorporated Association of National Advertisers), Mr. Ian McLaren (architect), and Mr. Humphrey Baker, of the "Scapa" (Society for Checking Abuses in Public Advertising). Mr. Beuttell concluded by saying that the illuminated advertising sign was a public problem, which was not likely to be settled if the interested parties continued to work behind closed doors or in watertight compartments

Mr. JOHN LANGDON remarked that illuminated signs certainly *could* be decorative. Although there were notable exceptions which signmakers deplored, the common standard of decorative value seemed to be high and to be improving. Those who took the view that illuminated signs were not decorative had perhaps a standard of their own, which was not necessarily that of the public. For every one person who appreciated the peace and quiet of the countryside there were at least a dozen who preferred the bright lights of the town and the noise and movement of the crowd. Such people wanted movement, light, glamour, atmosphere, and to them the electric sign was an essential to life. We have become so used to the signs that we have forgotten what London used to look like in the old days—its dull, depressing architecture, the gloomy closeness of the streets, the all-pervading nostalgic darkness—not at all like the beauty of the night in the countryside. In contrast, the decorative value of illuminated signs should be appreciated. Even if individual installations are open to criticism, one must admit that, viewed as a whole, the effect is pleasing to the eye and a stimulant to the senses.

Mr. Langdon added that too little attention had been given by architects to the decorative possibilities of illuminated signs. Much better results could be obtained with signs that were regarded by the architect as an essential and desirable part of his elevation than by signs which had to be applied to an already completed building. When a cinema, shop, restaurant or place of entertainment was built the architect knew that it would have signs on it sooner or later. Why did he not provide for them? Why build a cinema and then complain because the owners want to make it look like what it really is? Some architects had shown that elevations could be designed to which appropriate signs could be applied with advantage to the appearance of the whole edifice.

Finally, Mr. Langdon contended that the signmaker was not a vandal. He would always rather sell good signs than cheap ones, but he was not always given the chance to co-operate when co-operation would be useful, and he was often hedged in with out-of-date restrictions. Signmakers had a wonderful product, the decorative possibilities of which were enormous. If this product was not universally pleasing it should be remembered that the signmaker probably had to face all sorts of technical and commercial difficulties, and had finally produced the best job that could be achieved with the facilities at his disposal.

Mr. C. J. ROSE, who next spoke, said that he was all for co-operation. He had therefore read with consternation certain remarks in the Press, which he quoted, implying no desire for co-operation on the part of signmakers. He hoped that there was now evidence of a change of heart.

If users and makers could get together, and if other advertising interests could be brought in, there was great hope for the industry. But so long as a policy of selfish isolation prevailed he could see nothing but trouble. One of the greatest difficulties, experienced both by users and makers of signs to-day, was the fact that there were far too many badly designed and ineffective signs in use. He would be in favour of day and night signs only, by which he meant signs with good daytime visibility and pleasant illumination at night. Certain large advertisers annually paint and renew wiring to their signs. Why should not this practice become usual? As an act of mutual protection for all parties concerned, signs should be rigorously and systematically maintained.

Good design would reduce the objections taken by local authorities and amenity societies to this form of publicity, and should prove so effective to the users that good trade for the maker and the user would be synonymous. Mr. Rose mentioned several experiences in support of this claim. He was satisfied that neon signs in general beautified the streets by night. They were the gayest reminders at the disposal of advertisers, but there was one point that should receive more attention—their daytime appearance. An ugly mass of twisted tubing was inevitably unsightly. The same applied to certain forms of reflector signs, which were effective enough at night, but so unsightly in the daytime as to be a blot on pleasant rural surroundings.

Mr. I. MCLAREN agreed that illuminated signs were, in general, decorative at night, but in the daytime rarely so. He subsequently added that they might also be decorative by day if the architect were consulted as to their design and position. The designer of illuminated signs should avoid two pitfalls. Firstly, he should avoid "restlessness"; secondly, he should

remember that it is not always night. A jerky sign across the face of a building might command attention at night, but during the day the contempt of familiarity might become absolute loathing. A signmaker might spoil the appearance of a good building. In the case of a bad building he had a real artistic chance to improve its appearance—and he usually had the last word!

If a sign satisfied the business needs of a client it must be decorative by night and by day, but the second condition could only be secured if the sign were an incorporate part of the building. To achieve the best effect architect and signmaker must co-operate to the fullest extent. Certain cinema signs were mentioned as examples of first-class decorative efforts.

Mr. Beuttell had said that a sign might be popular or unpopular. The popularity of things of artistic worth was negligible, but this was largely due to lack of foresight on the part of manufacturers. The public could only purchase what was offered to them, few being able to dictate in regard to design, on account of price. Yet excellence of design had no bearing on price. If signmakers would employ a first-class, architecturally trained designer in their office, regardless of cost, before they employed a first-class salesman of signs—also regardless of cost—the financial gain would be greater if the choice was sound. He wished it were possible to launch a wide Press campaign in an attempt to educate the public in the merits of first-class design. Let those in London get together and form a combine to forward the sale only of signs of good quality—a combine of those antagonistic to the present lax and haphazard method of plastering façades with signs regardless of the detriment to the building and the daytime psychological effect on the citizen.

He refuted the suggestion that "Scapa" protected the public interest. The term "public interest" was purely relative. The public for whom the sign trade existed cared little for the squeaks of those who need no signs! But if artist and man of commerce could combine in the manner suggested the standard of public taste would be slowly but surely raised.

Mr. HUMPHREY BAKER explained that the "Scapa" were not irreconcilable opponents of all outdoor advertising. They recognised that advertising was legitimate and necessary, but desired that it should not be carried on in such a manner as to injure amenities. In discussing this subject one was up against the question of taste—one of the most disputable there is. He felt sure, however, that it would be agreed that in the beauty of our landscape, our villages, and our ancient towns and cities we had an asset which we ought not to squander, and that their amenities ought to be preserved.

He frankly did not think that coloured lights could in themselves be called unsightly, but illuminated signs were not merely lights, they were an advertisement of something. They conveyed an idea and a set of associations, usually about something that we might spend our money on. On the other hand, the place where any advertisement was displayed had its own separate set of ideas and associations, and these ought to be preserved and respected. There were certain sites and types of surroundings which ought to be regarded as out of bounds for illuminated advertisements of general commodities. Advertisements of business carried on on the local premises—inns, cafés, road-houses, etc.—were in a different category, but even here some restraint should be observed.

He would like to say a word in favour of floodlighting, which seemed by far the best way of calling attention to a building and enhancing its attractions at the same time.

As regards illuminated signs in towns he suggested that there should be more co-operation and less individualism. A street should be considered as a whole. A well-thought-out scheme of illuminated signs for all the buildings would be much more effective than the present confused medley.

In the subsequent discussion many useful points were raised. Mr. R. O. Sutherland urged that if the co-operation of architects were desired by signmakers on new buildings, architects in turn might expect to be consulted in the application of signs to existing buildings. There is always an element of artistry in the setting of signs. Authoritative data on signs and their application would be welcome.

Mr. Edmet pointed out that every form of illuminated sign had come in within the last quarter-century, and the neon sign only in the latter half of that. In such a new industry early designs were naturally not so good as those coming later. Mr. Andrews commented on the tendency to install signs of a certain size and type, irrespective of the architectural design of the building to which they were attached. Mr. R. O. Ackerley asked whether the sign industry could not take a leaf out of the book of the film industry and appoint a censor of signs. Mr. Webster and others urged that advertisers could often have more decorative and beautiful designs if they would accept the increased cost.

In replying to the discussion Mr. Langdon remarked that signmakers were far more in sympathy with "Scapa" than some advertising interests, who were apt to be dissatisfied with signs because they would not pay for good designs, as cinemas were more ready to do. He agreed that there was too much red light about, but in a few years' time, when fluorescent tubing becomes more general, and the greater range of colours available are appreciated, this predominance would disappear. The idea of censorship was difficult to carry out: there was seldom anything about a sign which was absolutely good or absolutely bad, and a censor's taste was not necessarily better than anyone else's. Mr. C. J. Rose urged that architects should recognise that the front of a building would be used for signs and arranged accordingly. He commented on the wonderful floodlighting display at the Barcelona Exhibition. Mr. Humphrey Baker suggested that certain outstanding parts of a city, especially those of historic interest, should remain dignified and devoid of the association of ideas forced on one by advertisements. But in other regions signs were not out of place. He did not himself object to the advertisements in Piccadilly—though he thought some of them might be better than they were.

Mr. W. J. Jones (chairman of the Commercial Lighting Section) wound up the evening by summarising the chief points brought out in the discussion and in conclusion moved the followng resolution:—

"That in the opinion of this meeting there should be a conference between the official bodies of the interests responsible for illuminated signs and of those which represent public opinion to explore the possibilities of co-operation."

This resolution was carried with acclamation.

Literature on Lighting

(Abstracts of Recent Articles on Illumination and Photometry in the Technical Press)

(Continued from page 123, June, 1939.)

II.—PHOTOMETRY.

177. Sill Ratio Method of Measuring Daylight in the Interior of Buildings

F. L. Knowles and J. E. Ives. Am. Illum. Eng. Soc. Trans., 5, pp. 523-543, May, 1939.

The results of a series of measurements on the distribution of daylight within a building are presented. It was found that the sill ratio obtained from these measurements sometimes differed by as much as 80 per cent. between morning and afternoon, this difference being attributed to variations in sky brightness. A new form of "sky vault diagram" is described, and values of sill ratio are given, calculated graphically from this diagram. Wide differences were found between these values and those directly measured, and it is concluded that accurate determination of the illumination within a building is not possible by the use of the sky vault diagram. J. S. S.

178. Spectral Analysis of Radiant Energy.

C. E. Weitz and R. F. Cissell. Am. Illum. Eng. Soc. Trans., 5, pp. 495-502, May, 1939.

Data are given on the spectral distribution of energy of certain lamps, mostly of the fluorescent type, now commercially available. It is shown how the varied characteristics of different lamps make them suitable for different applications. J. S. S.

179. Tests on a Liquid Prism.

J. Duclaux and G. Ahier. Rev. d'Opt., Vol. 17, No. 12, p. 417, December, 1938.

Liquid prisms have advantages, particularly in the design of very large apparatus. The construction of a liquid prism is described, and its optical properties reported upon. R. G. H.

III.—SOURCES OF LIGHT.

180. The Low-Down on Fluorescent Lighting.

O. P. Cleaver. El. World 111, p. 1,454, May 20, 1939.

The author stresses the point that the fluorescent tubular lamp newly introduced in America is a *new* lamp, and that a careful study is required to determine those applications in which its use will be advantageous. He specifies a number of such applications, and their use in different lighting fields. The main points are efficiency of approximate daylight colour rendering, and less production of heat; and the shape of the lamp has advantages for some applications. Many factors bear on the economics of their use, and each case must be considered on its merits. As standardisation develops, cost of fittings, equipment, etc., should decrease, and the new lamps find wide application. S. S. B.

181. Effects of Impurities on Fluorescent Compounds.

J. W. Marden and G. Meister. Am. Illum. Eng. Soc. Trans., 5, pp. 503-513, May, 1939.

Data are given showing that the response of fluorescent materials is controlled by the addition of impurities. Certain foreign materials are necessary to give the maximum effect, while very small amounts of other impurities reduce the fluorescence very greatly. It is said that no materials sufficiently pure are available commercially at present. J. S. S.

IV.—LIGHTING EQUIPMENT.

182. "Sheltalite" Unit.

Anon. El. Times, Vol. 95, p. 628, April 27, 1939.

A brief description with photograph of a battery equipment for lighting A.R.P. shelters. The 12 volt battery is said to maintain two 24-watt lamps for fifteen hours. W. R. S.

183. Stroboscopes.

Anon. Electronics, 12, No. 5, p. 66, May, 1939.

Some details are given of a portable unit for both speed measurement and slow-motion studies of rotating and reciprocating mechanisms. Speeds between 600 and 14,400 r.p.m. are read directly from a scale, and measurements can be made with an accuracy of ± 1 per cent. The apparatus can also be used as a light source for single-flash photography. S. S. B.

184. Stroboscopic Device Checks Small Motors.

U. J. Rappel. El. World, 111, p. 1,492, May 20, 1939.

A device, using 3 watt. neon lamps to provide the periodic light, is described, by means of which the speed of small motors can be measured, based on stroboscopic effects. S. S. B.

V.—APPLICATIONS OF LIGHT.

185. Light and Architecture.

Anon. Am. Illum. Eng. Soc. Trans., 5, pp. 477-486 May, 1939.

Some representative architectural lighting schemes are described with photographs. J. S. S.

186. Indoor Lighting.

H. L. Juliusburger. Elect., 122, pp. 738-739. June 9, 1939.

A suggestion is made on the application of dimness in the lighting of a room in order to meet the individual "comfort" requirements of the occupant. C. A. M.

187. Industrial Efficiency.

"Works Engineer." Elect. 122, p. 740, June 9, 1939.

The various types of flameproof lighting equipment available are discussed, together with the conditions in which they must be used. C. A. M.

188. Local Lighting.

W. Robinson. El. Rev., Vol. CXXIV., No. 3,208, p. 713, May 19, 1939.

Examines the problem of factory lighting, and concludes that local lighting is of value as a supplement to a high standard of general lighting, particularly in cases of work being done on dark fabrics. R. G. H.

189. New Coffer System for New York Bank.

Anon. El. World, 111, p. 1,342, May 6, 1939.

A description is given of the lighting of a New York bank, using a system of coffer lighting, in order to avoid any points of disturbing high brightness. An illumination of 25 to 30 ft.c. at desk level is provided. S. S. B.

190. Blended Light.

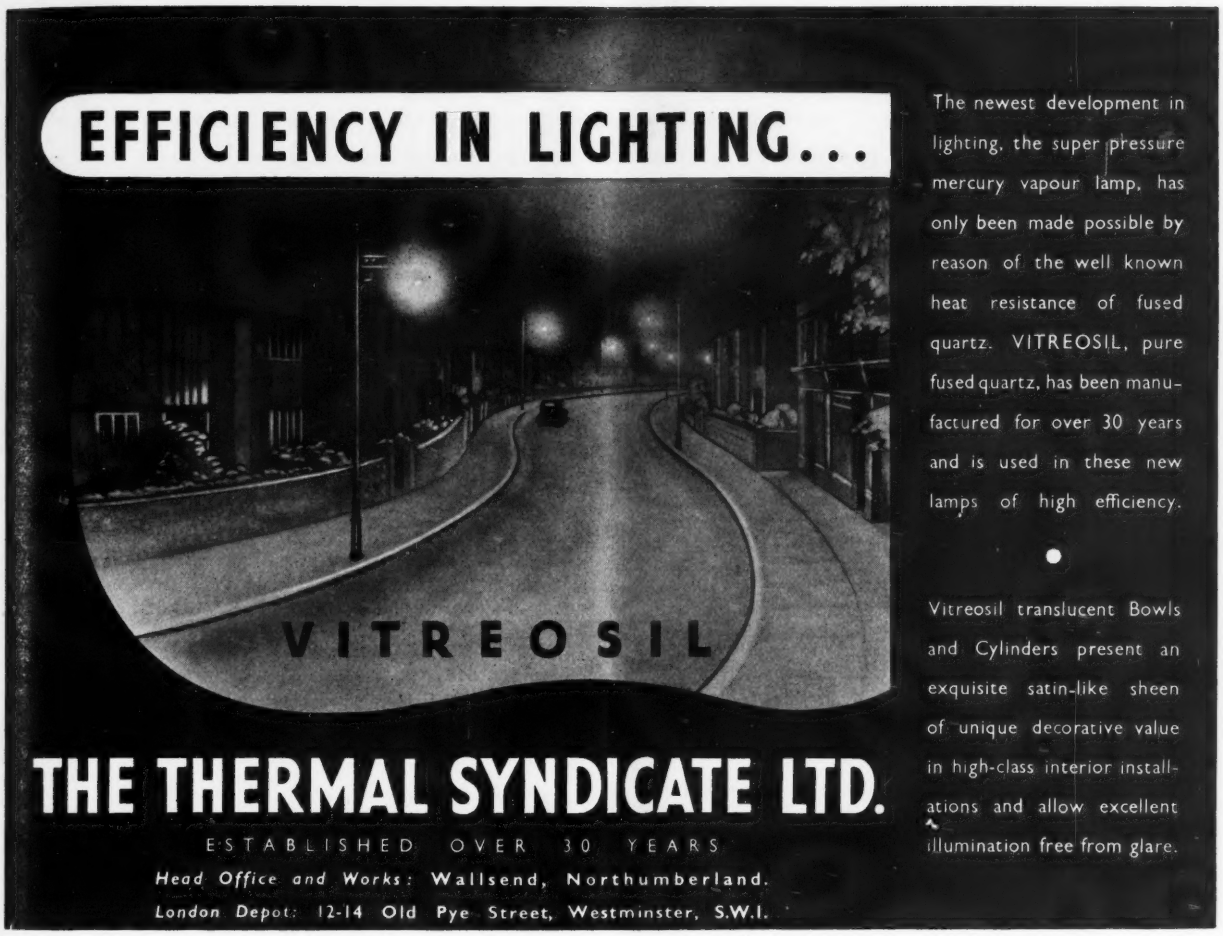
A. H. Olsen. El. Rev., Vol. CXXIV., No. 3,209, p. 747, May 26, 1939.

Discusses the blending of tungsten and mercury vapour lighting for shop displays, and desirable proportions of mercury to tungsten light for various types of display are suggested. The same progress has not been made in the design of interior lighting installations as in window lighting. The fluorescent lamps should prove valuable in the design of interior installations. R. G. H.

191. Utility Showroom with 48 kW. of Light.

Charles Gallo. El. World, 111, p. 1,690, June 3, 1939.

Details are given of the lighting in the showrooms and offices of an American electric utility company. Mercury


EFFICIENCY IN LIGHTING...
VITREOSIL
THE THERMAL SYNDICATE LTD.
ESTABLISHED OVER 30 YEARS
Head Office and Works: Wallsend, Northumberland.
London Depot: 12-14 Old Pye Street, Westminster, S.W.I.
The newest development in lighting, the super pressure mercury vapour lamp, has only been made possible by reason of the well known heat resistance of fused quartz. VITREOSIL, pure fused quartz, has been manufactured for over 30 years and is used in these new lamps of high efficiency.
Vitreosil translucent Bowls and Cylinders present an exquisite satin-like sheen of unique decorative value in high-class interior installations and allow excellent illumination free from glare.

vapour-tungsten filament lamp combination indirect lighting units are largely employed, and illumination levels of 30-40 ft.c. are maintained. Incandescent lamp indirect lighting units are used in the offices. Full details of the lay-out are included. S. S. B.

192. High Intensity Light for Playing Field.

E. B. Karns. El. World, 111, p. 1,304, May 6, 1939.

A detailed description is given of the lighting of an American football field, which is claimed to be illuminated to a higher value than ever achieved before. An average illumination of 59 ft.c. over the entire playing area is obtained, with a maximum of 81 ft.c. Six 110 feet towers are used, carrying 160 floodlights, with a total load of 276 kW., using anodically oxidised aluminium reflectors. The lamps are operated at 10 per cent. over voltage, and the load on each tower is electrically balanced. S. S. B.

193. Paris Lighting Display.

Anon. El. Rev., Vol. CXXIV., No. 3,209, p. 748, May 26. 1939.

Describes the exhibition arranged jointly by the Salon de la Lumière and the Salon des Artistes Décorateurs. The exhibition is noteworthy as giving examples of the possibilities of installations made by the average contractor without any special equipment. R. G. H.

194. Effectiveness in Lighting Ping Pong Tables.

R. R. Whipple. Am. Illum. Eng. Soc. Trans., 5, pp. 514-522, May, 1939.

Describes the effect of changes in lighting on the performance of four ping pong players; the tests extended over a period of nine months. It is said that the best results were obtained with an illumination of 40 ft.c. from indirect lighting stages. J. S. S.

195. Fountain Lighting at New York World's Fair.

Anon. Elect. 122, pp. 767-768, June 16, 1939.

A description, with photographs, is given of various lighting effects including illuminated fountains, at the New York World's Fair. C. A. M.

196. The Camera Reports.

Anon. El. Times, 95, p. 701, May 11, 1939.

Gives a set of photographs with brief descriptions of various installations, including both industrial and decorative installations. W. R. S.

197. Obscuring Factory Windows in War Time.

Anon. El. Times, 95, p. 794, May 25, 1939.

Describes a method of lighting for Air-raids Precautions, in which blue paint is applied to the windows and filtered sodium light in the building. W. R. S.

198. Lighting in War Time.

Das Licht, LX., 4, pp. 70-88, April 30, 1935; pp. 91-93, May 31, 1939.

A series of articles reviews methods of lighting under war conditions; diminished industrial lighting, mechanical screening devices, the application of fluorescent materials in darkened engine rooms, and the scientific darkening of streets is discussed in considerable detail. J. S. D.

199. A Hundred Years of Photography.

Anon. Nature, Vol 143, No. 3,632, p. 963, June 10, 1939.

A summary of the progress of photography from the time of Daguerre and Fox-Talbot to the present day. R. G. H.

Recent Patents

(Abstracts of recent Patents on Illumination & Photometry.)

No. 503,760. "Improvements in and Relating to Fluorescing Compositions."

The British Thomson-Houston Company, Ltd. Dated October 8, 1936. (*Convention, U.S.A.*)

This specification describes a fluorescing composition for a light transforming surface comprising an alkali metal salt of rhodamine B and a binder such as a product obtained by reacting a hydrolized polymerized vinyl ester with an aldehyde. The composition may comprise a potassium salt of rhodamine B, cellulose acetate, and a liquid solvent such as acetone.

No. 503,764. "Improvements in or Relating to Adjustable Mounting Devices for use, for example, in Supporting Lighting Fittings or the like."

The General Electric Company, Ltd., and Hubbold, S. Dated October 7, 1937.

According to this specification an adjustable mounting, particularly a pendant mounting, comprises a pivoted member adapted to form part of or rigidly associated with the article, such as a lamp to be supported, this pivoted member having a rigid extension engaging a non-resilient plate, the plate and the pivot being spring biased towards each other. The arrangement is such that the spring biased plate applies a balancing force at the end of the extension to maintain the pivoted member in any desired position to which it may be moved. The pivot may be a ball and socket joint. The plate may have recesses or the like to provide definite locating positions for engagement of the extension.

No. 504,325. "Improvements in Lighting Standards for Roadways and the Like."

Concrete Utilities, Ltd., Marques, C. A., and Thomas, F. Dated June 20, 1938.

This specification covers a light standard comprising a pole or standard of reinforced concrete, of which the part or whole is integral with a reflector casing for an electric light source, which casing is also of reinforced concrete.

No. 504,354. "Improvements in Sources of Light, Comprising an Electric Discharge and Luminescent Material Excited by the Discharge."

The General Electric Company, Ltd., and McKeag, A. H. Dated October 20, 1937.

This specification relates to lamps in which a discharge is passed through a gas to excite at least one component of the spectrum of that gas, and luminescent material is excited by the discharge. According to the specification the luminescent material is, or comprises, luminescent magnesium-cadmium-tungstate which is preferably mixed with free magnesium oxide or free cadmium oxide or both.

No. 504,432. "Improvements in High-Pressure Mercury Vapour Electric Discharge Lamps."

The General Electric Company, Ltd., Dated July 28, 1937. (*Convention, Germany.*)

According to this specification a high-pressure mercury vapour lamp is operated on a positive or slightly negative portion of its characteristic in series with a stabilizing impedance of low value or zero, the arrangement being such that, after a suitable interval from connection to the mains after which the impedance element mentioned and no other is in series with the discharge, the discharge assumes a steady state in which the power dissipated per centimetre length of the discharge is not less than 30 watts per centimetre and the voltage across the impedance is not more than 10 per cent. of the mains voltage. The additional starting impedance whose value is greater than that of the running impedance may be provided, and a bi-metallic switch may be provided to cut out the one and cut in the other.

No. 504,683. "Improvements in Apparatus for Grading Objects According to their Effects on a Light Beam."

Booth, E. T. Dated June 19, 1937. (*Convention, Australia.*)

This specification covers a grading system in which objects are moved over a scanning area with which is associated an illuminating system and a light sensitive cell, and on to which area is directed a nozzle from which a fluid stream issues. A movable shutter is arranged to operate in a plane between the end of the nozzle and the scanning area to deflect the stream of fluid from the scanning area or allow it to issue thereto according to whether the object in the scanning area is to be passed or dislodged. The position of the shutter relative to the stream of fluid is controlled by the light sensitive cell.

No. 504,893. "Improvements in or Relating to Electric Incandescent Lamps."

N. V. Philips Gloeilampenfabrieken. Dated October 4, 1937. (*Convention, Holland.*)

In order to permit increase of the size of the bulb of a gas-filled lamp within which the operating pressure exceeds two atmospheres and thereby to reduce blackening and at the same time to reduce danger arising from bursting the bulb, whose diameter is in excess of 20 mm. and preferably in excess of 25 mm., is enclosed by a second bulb, and the space between the two bulbs or the pressure in that space is so proportioned that in the event of the inner bulb bursting the pressure in the outer bulb is from a quarter to one atmosphere.

No. 505,143. "Improvements in Circuit Arrangements for Electric Discharge Devices."

The British Thomson-Houston Company, Ltd. Dated June 19, 1937. (*Convention, Germany.*)

This specification relates to the production of periodic flashes of high intensity for stroboscopes and the like from discharge lamps. A condenser is arranged to be discharged through the discharge lamp, and means are furnished for applying an ignition impulse of high voltage to the discharge lamp to initiate the discharge of the condenser therethrough, and a rectifier is connected between the condenser and the discharge lamp to isolate the condenser from the high voltage impulse.

Impressions of the Meeting of the International Illumination Commission in Holland

(Specially Contributed)

Wide Scope of Papers and Reports—An Exhibition of Lighting Progress—The Visit to Eindhoven — Museum Lighting —Visit to Schiphol Aerodrome (Amsterdam) — Sodium Road Lighting — The K.E.M.A. Testing Institution at Arnhem —The Reclamation of the Zuider Zee —Next Conference in Paris (1942) —Dr. Halbertsma the New President

The tenth full meeting of the International Illumination Commission was held from June 12 to 20, in Scheveningen, Holland's leading watering-place. The previous meeting was held in Germany in 1935.

Wide Scope of Papers and Reports.

To cover in any detail the mass of work embodied in the various Secretariats or to summarise, in the space available, the content of the thirty-odd papers submitted would be too formidable a task. It is understood that such material will form the subject of a contribution to the Illuminating Engineering Society later in the year. The present article is directed rather to giving some account of the programme outside the committee rooms, but it may be well to put on record that there were meetings associated with the work of twenty-four active committees dealing respectively with Vocabulary, Definitions and Symbols, Units and Standards of Light, Light and Vision, Visual and Physical Photometry, Colorimetry, Sources of Light, Diffusing Materials, Classification of Light Distributions, Lighting of Public Ways, Automobile Lighting, Architectural Lighting, Aviation (Ground and Aircraft) Lighting, Traffic Signs, Daylight (Natural and Artificial), Mine Lighting, Ultra-Violet Radiation, Lighting Education, Lighting Practice, Voltage Variation, Cinema Lighting, and Theatre Stage Lighting. In many of these sections resolutions were drafted and approved. Some of these were on broad lines, such as those concerned with the collection of information on the relation between street lighting and accidents and with the desirability of giving general instructions in the fundamental principles of illumination to school children. Others, such as those concerned with aviation lighting and the specification of quality of ultra-violet radiation, evidently brought with them a vista of much further intricate work. Of special interest, in connection with this meeting, was the reference, in the Secretariat Report on Units and Standards, to the official adoption of the new black body incandescent standard of light and of the new international candle based thereon. which is to come into operation in 1940

Photo: K.L.M.

An aerial view of the Philips' Works at Eindhoven, showing the lamp works and the radio valve works and, on the right in the foreground, the head offices.

The Municipal Museum at The Hague floodlighted by 24 150-watt sodium lamps.

International Representation.

Some measure of the importance which now attaches to illumination and its allied subjects is found in the fact that notwithstanding the present-day international anxieties, there were present representatives from: Belgium, Eire, France, Germany, Great Britain, Holland, Hungary, Italy, Japan, Poland, Spain, Sweden, Switzerland, and the United States of America.

Truly a Babel of tongues, but the remarkable versatility of the Dutch—most of whom seemed to be at least trilingual—smoothed away difficulties. Both in and out of the sessions language was no handicap.

Altogether about 450 delegates and visitors were inscribed members, with Holland, as the host country, capping the list with one-third of the total membership. Great Britain and Germany followed with about ninety and seventy in their respective parties.

The Commission's headquarters, with the main Secretariat and the ably-administered Information Bureau, were in the Palace Hotel.

Preliminaries and the Formal Opening.

Documentation and method are highly developed arts in Holland, and the preliminaries of inscription, obtaining programmes, badges, papers, and the necessary gulden flowed smoothly, thanks to the courtesy and efficiency of the corps of Dutch ladies who conducted the Information Bureau.

An informal reception on the evening of arrival by Dr. L. R. Wentholt, the President of the Netherlands Illumination Committee, was followed next day by the Plenary Inauguration of the Session, which was held in the Salle de Réception of the Palace Hotel. The inaugural address by Mr. J. A. M. Buuren, the Netherlands Minister of Transport and Public Works, stressed the economic, aesthetic and scientific repercussions of the Commission's work, and reminded his hearers of the still unexplored fields before them as workers in one of the youngest of the applied sciences. Among the many applications of lighting within his own Department of State, he referred to the existing installation of gaseous discharge lamps on 30 km. of the Netherlands national roads and the plans in hand for a total of 125 km. of national roads with non-separated tracks and a minimal usage of 2,400 motor vehicles *per diem*. The retiring President of

the Commission, Prof. Ch. Fabry, made a graceful response.

An Exhibition of Recent Lighting Progress.

In the Palace Hotel two rooms were devoted to a permanent exhibition, chiefly directed to lighting developments of the past few years. Comparison of a model of the first oil lamp-post used in Amsterdam in 1663 with the water-cooled 2-unit super-pressure 500,000 c.p. mercury lamp or the 70 ampere gas-filled filament lamp for lighthouses served as an apt reminder of the march of lighting progress. Applications of discharge lamps furnishing ultra-violet light were demonstrated by models fitted with inviting press-button switches. One of the most striking showed how, in a power station, darkened for air raids, instrument dials, the outlines of plant and switchgear, and luminous guiding tiles may be rendered amply visible by subjecting luminous paints to ultra-violet radiation. Visitors were impressed by the compactness, rigidity, and ease of manipulation of the Philips' twin kinema picture and sound projector with super-pressure mercury lamps.

Education in the elements of illumination and lighting technique was shown by ingenious models, booklets, and a set of diagrams which, starting from a simple water sprinkler analogy, is designed to carry the novice by easy stages to clear conceptions of the candle power, lumen, lux, and stilb. There was an array of excellent photographs of current lighting installations, of which a series of sodium light pictures stood out in realism, and the rendering of illumination values. Even statistics were exhibited in a compelling manner. In this section a large glass beaded map of Holland was *facile princeps*, showing realistically the existing 30 km. of sodium-lighted Netherlands national roads and those which are to follow, as described by the Minister of Transport in his opening address.

Visit to Eindhoven.

This function, which undoubtedly was one of the "high-lights" among the technical visits, figured modestly in the programme as a technical excursion by special train to the Philips' works and laboratories. In fact, such a visit is much more, producing as it does a vivid impression of a vast sociological undertaking—a highly organised community of scores of thousands of souls centring about the factories and laboratories but having a life, amenities, and social institutions of its own.

The number of Philips' employees in the Netherlands is about 15,000 to 16,000, most of whom are centered at Eindhoven, where a town, Philips Dorp, has grown up on model lines. Through a series of building societies the Philips' concern controls over 4,000 houses, of which some 3,500 are for workmen, over thirty shops and nearly forty farmhouses. There are two kindergartens, four elementary schools, one higher elementary school, and a training school for boys, the whole being managed by the Philips' Association for Instruction and Popular Education, an organisation sanctioned by royal decree. This is all supervised by educational and social inspectorates and leads up to various certificate examinations by Government examining boards.

The factory women are trained in cooking and housewifery, and the boys go through an apprentice course, in addition to which there are evening courses in commercial subjects and languages, and a separate school of stenography. For recreation there are parks and a recreation building with a theatre which seats 1,000 people. There is a library of 10,000 volumes and provision for many clubs for outdoor, musical, and other cultural activities.

A panoramic view of Delegates and visitors taken outside the Kon... very c... his right and ... on his ...

Directly administered by the works is an elaborate welfare and medical system, the latter of which includes systematic examination for tuberculosis, the incidence of which has been brought down in a striking manner. Another department concerns itself with all kinds of problems of factory and labour hygiene, and yet another with the transfer of employees from one department to another for reasons of health

The works comprise a large number of separate factories laid down, apparently, on a policy of being largely independent of outside supplies. There are, for example, factories or departments for rare gases, diamond dies, paper and cardboard, printing, machinery, brick-making, woodwork, plastics, lamps and valves, X-ray apparatus, television and radio equipment and sets, and many other products and processes. And, in addition, there is a research wing

of 4½ acres, comprising some 400 laboratories and workrooms.

Visitors were offered a choice of two tours of inspection, viz., one chiefly of physical interest and the other chiefly technical. There was, however, a considerable amount of common ground, and in both cases the organisers skilfully minimised fatigue by interpolating lectures and similar grateful reposes in the arduous day's tramp about the works.

An equator dividing the physical from the technical was, perhaps, found in the form of the electric house with its very ingenious switching system to show the possibilities of domestic lighting. The quaint life-size dolls which inhabit this house were admirably designed to plant these exhibits in the memory of visitors.

In the plastics factory was seen the production of "Philite" mouldings ranging from minute components up to the complete radio set cabinets which emerged from the 1,000-ton presses. Assembly of valve and radio components by lightning-endowed fingers and the manufacture, viewing, gauging, and grading of myriad parts was also demonstrated. In the glassworks were witnessed the fascinating pro-

"Polygcon" photo

e very centre is Dr. N. A. Halbertsma, with Dr. C. C. Paterson on on his left.

cedure of blowing tube by lung power as well as the manufacture of bulbs and cathode-ray tubes by machine and by the blowpipe.

A demonstration of the Philips' super-pressure mercury lamp sound and film projector was given in the theatre after a lecturette by Dr. Halbertsma on the optics and general arrangement of the machine. Visibility and balance of values with black-and-white film were excellent, and the same may be said of a coloured propaganda film in doll and cartoon work which was also shown, viz., an amusing and very modernised version of the "Sleeping Beauty" produced by the Hungarian architect Geo. Pál

Television was demonstrated both in the studio and in fixed and travelling van receivers, and a crowded half-hour was also spent among exhibits in the museum of the industrial school.

Those in the physics party inspected some of the laboratories. Dr. J. P. Bouma demonstrated his method for spectral analyses of coloured lights, and Dr. J. E. Schouten showed experimentally the work behind his paper on a binocular method for investigating the adaptive component of glare, communicated subsequently to the Committee on Light and Vision.

Not the least striking of his experiments is an elegant method for enabling a subject to see the venous and arterial systems of his own sclerotic membrane.

In the photometric laboratory Dr. Groot demonstrated the "Pharaoh" ribbon filament lamps with flat windows designed to eliminate internal reflections, gaseous and vapour discharge lamps, including the large super-high-pressure aerodrome landing lamp, ultra-violet lamps, and many more interesting items.

Others displays in the laboratory included a demonstration by Dr. J. P. Bouma of the accentuation, at weak intensities, of the apparent contrast in brightness of adjacent surfaces lighted by sodium lamps as compared with mercury discharge lamps, and the exhibit of the apparatus designed by Dr. Bergmans for testing reflecting properties of road surfaces of coarse structure.

A crashing spark at 1½ million volts in the high-tension laboratory brought the visit to a spectacular close.

The Lighting of The Hague Museum.

An evening reception by the Burgomaster and Aldermen of The Hague gave an opportunity of inspecting the artificial lighting of the beautiful Municipal Museum, which was designed by the architect H. Berlage.

Prof. L. S. Ornstein, of Utrecht, described the lighting arrangements with which he was concerned. Preliminary studies had shown that values from 80 to 150 lux were desirable. For daylight conditions this is obtained by a series of adjustable hand-operated louvres or screens placed immediately below the glazed penthouse roofs of the galleries. Below these louvres is a large horizontal opaline glass screen and below this again is a frosted glass ceiling to the gallery for better diffusion. Manipulation of the louvres in accordance with the light variation during the day enables the desired illumination value and uniformity to be obtained on the walls on which the pictures hang. For artificial lighting lamps are

switched on between the opaline sheeting and the louvre screens, which are then turned completely horizontal so that their whitened under surfaces reflect the light downwards through the opaline and frosted glasses below. In another gallery the same system is used in combination with a horizontal translucent velum, i.e., a false luminous ceiling hung above the observer's head. The uniformity of the picture lighting and absence of glare were undoubtedly good, but the variation of illumination level from room to room seemed, in some instances, pronounced. Good effects were seen in small bays where lanterns with prismatic ribbed glass are used, and in local showcase lighting by a combination of opaline and prismatic glass.

The collection is rich and varied: pottery, glass, pictures, tapestries, sculpture, and a famous collection of musical instruments provided a leisured and delightful evening, the introduction to which had been three witty speeches in as many languages from Mr. Monchy, the Burgomaster.

Lighting in an Aerodrome and in Amsterdam.

With sunset at 9.25 p.m. and a long programme thereafter, here at least was a real reason for another late night when Schiphol, the airport of Amsterdam, was visited. During the daylight period there was a drive round the airport buildings, where the hangars, repair shops, etc., and the many planes about the ground were examined. After sunset the various beacons, boundary, identification and obstruction lights, landing strip lights, and control installations were seen in operation, with the aid of explanations by Mr. Dellaert, the airport manager. Objects of special interest were the great landing T in blue neon, the fog strip in sodium units, and the super-pressure mercury landing floods. The main floodlight consists of three superposed Philips projectors, each containing a 2 kW water-cooled super-pressure mercury lamp and contributing one-third of the total light. Each lamp is mounted horizontally in a cylindro-parabolic silvered glass reflector and is cooled by a motor-driven pump in a closed-circuit water system which includes a miniature fan-cooled radiator of motor-car type. The beam spread is about 2° in the vertical plane and 120° in the horizontal—a flat spatular tongue of light with a maximum intensity of 2,700,000 c.p. admirably designed for covering large ground areas.

An interesting comparison between fixed and flashing under-lights on planes in flight was also demonstrated.

From 10.30 p.m. until close on midnight 120 of the visitors had an opportunity of seeing the night lighting of the airport and of Amsterdam and its environs from the air. By the courtesy of the K.L.M. Lines, the Municipality of Amsterdam and the Philips' organisation, large passenger planes were placed at the I.I.C.'s disposal, and four flights were made at half-hourly intervals at a sufficiently low elevation to enable every detail of the city and airport lighting to be seen. The obscuration problems of A.R.P. could be brought to mind in no more vivid way.

Visit to the Rijks Museum (Amsterdam).

An alternative programme enabled others to be conveyed by motor coach to Amsterdam, where they had the privilege of meeting the assistant director of the Rijks Museum and being personally conducted on a tour of the principal galleries. Here was an opportunity not only to see many of the art treasures but to see them under conditions of special interest to lighting engineers.

The artificial lighting of the galleries has been skilfully arranged, several special devices being most effective. Among these may be mentioned the use of the tops of showcases about 7 ft. high to carry concealed floodlights for illuminating pictures, tapestries, and other exhibits on the upper walls. The lighting of the celebrated Rembrandt painting, "The Night Watch," has been dealt with on quite unusual lines. The picture has a wall to itself and is the only lighted feature in the room. The light falls on it from a projector fitted with a rectangular mask, so that the patch of light exactly fits the picture and the source of the light cannot normally be seen, as it is fixed above a large canopy filling the centre of the room.

Sodium Road-Lighting.

After leaving the Rijks Museum and noting the beauty of the exterior when floodlighted, the return journey was made via the Amsterdam-Haarlem road, so that members could see the effect of main-road lighting by sodium. 85-watt lamps are fixed in simple reflectors mounted at about 30 ft. above road level and with 105 ft. staggered spacing. The effect as viewed from the motor coach was of alternate light and dark bands across the road, the bands of light being more than twice as broad as the dark bands. In the foreshortened view of the road the dark patches appeared to have very little effect on visibility, and it was always easy to see a near object by direct illumination or a distant one in silhouette.

The "cut-off" used on the fittings undoubtedly contributed to the good visibility, and the extreme simplicity of the equipment—poles, brackets, and reflectors—gave the impression that the cost of the installation per mile would probably not be any greater than one having fewer fittings but of a more complex construction.

Gelderland, the K.E.M.A., and Van Goch.

Anyone strange to Holland who joined the excursion to Arnhem on June 18 revised his views of Dutch scenery, for in Gelderland the normal flatness of the country is surprisingly replaced by rolling ground, densely wooded, and a delight to the eye.

The testing institution of the K.E.M.A., delightfully placed in the old estate, Den Brink, outside Arnhem, is owned by the Dutch and Netherlands E. Indies electrical undertakings. It fulfils the joint functions of a commercial testing station for plant and electrical material, a standardising institution, a research centre an authority for the promulgation of electricity regulations, and an electrical propaganda and education department.

It has been fully described elsewhere by its Director, Prof. van Staveren,* who received the I.I.C. party. Visitors inspected the high frequency and general laboratories, the photometric department (where only alternating voltage is used, regulated to 0.5 per cent. for commercial testing), and the intermediate high voltage laboratory for work up to 300 kv. More spectacular are the heavy current department, where currents of 34 ka. is available, the short-circuit test buildings with plant of a three phase breaking capacity of 660,000 kva., and the magnificent high voltage building nearly 50 ft. high containing transformers giving up to 525 kv. and a towering impulse generator with a nominal no-load voltage of three million and an impulse current output up to about 300 ka.

Beauty of landscape was again unfolded during the drive to lunch, which was served at Wageningscheberg. From this hilly viewpoint one of the finest panoramas in Holland extends down to the Rhine.

A further journey through parkland brought the party to the famous Kröller Müller art collection, a feature of which is the wonderful exhibit of Van Goch's pictures, where visitors were again reminded of the architectural ability, skill in gallery lighting, and subtle wisdom of display which the Dutch devote to their collections.

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* J. C. van Staveren. The Organisation, Work, and Laboratories of the N.V. K.E.M.A. at Arnhem. A Lecture delivered before the Transmission Section, Inst. El. Engineers, December 14, 1938.

A pleasing view of the main canal at Leiden.

A typical canal scene at Alkmaar.

A Memorial to the opening of the great dam thoroughfare across the Zuider Zee.

IMPRESSIONS OF HOLLAND

We give here a few typical pictures out of the many taken by visitors to the I.I.C. recording their impressions of Holland. For the pictures reproduced we are indebted to Mr. A. R. McGibbon and Mr. A. G. Higgins.

A group of delegates on an excursion (Mr. A. G. Higgins, Mr. A. R. McGibbon, Mr. F. C. Smith, and Mr. Crawford Sugg).

A section of the vast dam completely closing the Zuider Zee. By the side of the main road is a cycle track, and there is further space on the right.

A view of Volendam, the famous fishing village on the Zuider Zee.

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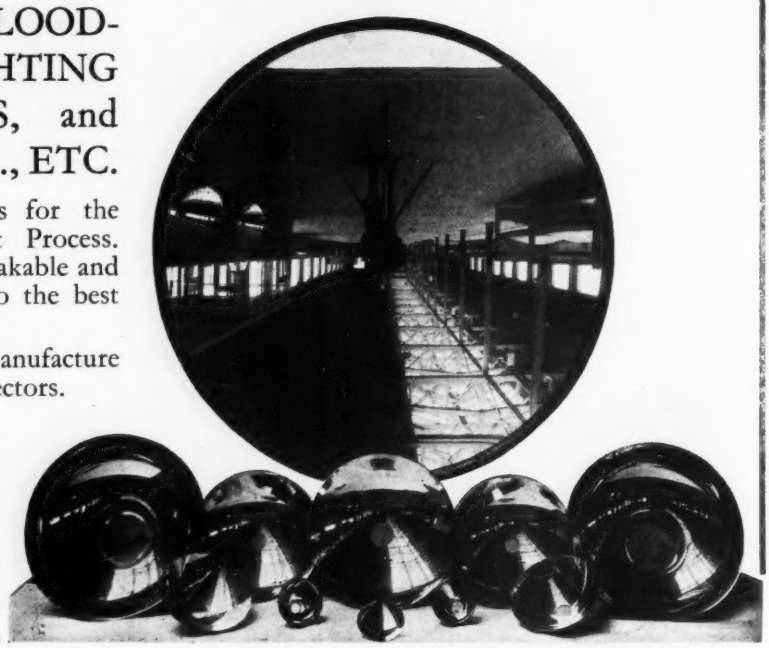

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"Fresh Fields and Polders New."

The last day of the visit was devoted to an excursion to the reclamation works of the Zuider Zee, which were reached by coach via Leiden, Haarlem, and Alkmaar, where the journey was broken for an inspection of the Weigh-house, a pearl of Dutch architecture.

Briefly the Zuider Zee scheme consists in stopping off the northern open end of the waters by a short dam to the island of Wieringen and a long one from that island to the Friesland coast opposite. The Zuider Zee being thus totally enclosed, the drainage of four large areas will follow, leaving a fresh water lake among them, the Ijselmeer, of some 270,000 acres, which will give an outlet to the North Sea through locks in the main dam. By removal of drought risk in the provinces of N. Holland and Friesland, and by the supply of water for the Friesland canals, the capitalised value of this lake alone is estimated at about £16,000,000. As to the four reclaimed areas, or polders, when complete they will add over half a million acres to the habitable area of Holland and 10 per cent. to its cultivatable land. And so a population of 3,000 fishermen, who hitherto have earned a precarious livelihood on the Zuider Zee, will ultimately give place to an established community of 300,000 souls. These are the barest statistics of this epic of water engineering, the immensity of which was unfolded in its technical detail by the engineers who conducted the party over the now completed Wieringen polder, the smallest of the four. Impressive figures of the vast pumping operations involved—the two Wieringen pumphouses can deal with 380,000 gallons per minute—the quantities of concrete, boulder clay, brushwood, steel, etc., were quoted. To stand at the centre point of the great twenty-six-mile dam and witness its arrow-flight straightness beyond the limits of visibility on either hand, while lapped with salt water on one side and fresh water on the other, was, indeed, an experience. Even more impossible seemed the lush meadows with their cattle, crops, haystacks, and trim villages, and the forests of sapling trees standing where a few years ago the sea reigned supreme. Truly it is said that in Holland Providence made the water, but the Dutch made the land.

The return journey was made via Volendam, where tea was taken, and an opportunity was afforded for camera records of baggy trousers and wooden shoes; thence by the southern road through Amsterdam.

Banquets, Receptions, and the Ladies.

These notes would be incomplete without some reference to the gala banquet and the many receptions which did so much to underline again and again the courtesy and hospitality of Holland. Mention should also be made of the entirely separate programme arranged by the Dutch hostesses for their lady visitors, of which acknowledgment was made in a very charming speech made by Mrs. C. C. Paterson at a reception to the Dutch delegation arranged at Scheveningen by all the other delegations on June 17.

The Next I.I.C. Conference.

It only remains to add that at the Plenary Closing Session, when the usual official business was transacted, an invitation to hold the next (1942) gathering in Paris was gratefully accepted. Members of the Illuminating Engineering Society, a number of whom have pleasant recollections of visits to Paris during the period of the recent International Exhibition, will look forward to this event with pleasure. There will also be general satisfaction at the announcement that Dr. N. A. Halbertsma, to whose skill and effort the very happy conditions in Holland were so largely due, is to be the next President. No better choice could have been made.

Public Lighting With Gas

The First M.O.T. Grant—Developments in Abergavenny, Stockton-on-Tees, Tewkesbury, and Leighton Buzzard.

Some little time ago we recorded the first instance of a street lighting scheme to qualify for the Ministry of Transport grant under the Roads Act, 1936—the installation of sodium electric discharge lamps on the London—Bath road.

We note with great interest that several schemes of gas lighting have similarly qualified for grants.

Abergavenny

The first gas lighting scheme in this country to receive the distinction is that recently carried out on 1¼ miles of the Newport—Shrewsbury road. This part of this important traffic route lies in the area of the Abergavenny Corporation, and the Corporation gas department is in charge of the lighting.

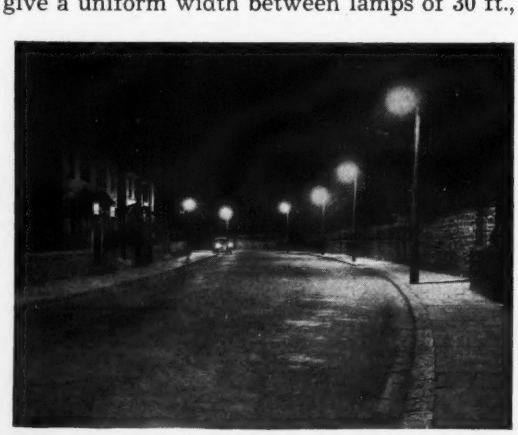
The new installation, which is for a term of ten years, comprises fifty-four gas lamps of the latest pattern, each of which has ten mantles. They will be mounted on 25 ft. steel columns, with a 6 ft. overhang on to the roadway, and will be spaced at intervals of 120 ft. to 150 ft., according to bends, road junctions, etc. Automatic lighting and extinguishing devices are fitted to all lamps. The contribution of the Ministry of Transport to this improved lighting system is a 50 per cent. grant for capital charges and a similar grant for annual maintenance and supervision. The Abergavenny Corporation Gas Department is also carrying out a number of improvements in the town's street lighting, although this is not eligible for a Ministry of Transport grant.

Stockton-on-Tees.

Since the above decision there have been several other instances of the Ministry of Transport grant being made for gas lighting schemes, the Ministry in each case making the agreed 50 per cent. contribution.

The Stockton-on-Tees Corporation have received notification from the Ministry of Transport to this effect in regard to a modern installation of gas lamps for an important main trunk road—A.67, A.19, and A.176—running through the town from the Borough Boundary Victoria Bridge to the Borough Boundary in Darlington-road. The contract is for ten years.

The new installation will consist of 111 twelve-light gas lamps, fitted with automatic controllers and comet igniters. The lamps have a mounting height of 25 ft. from road to light source, and are spaced at 120 ft. The lamp overhang has been so arranged as to give a uniform width between lamps of 30 ft., the width of carriageways varying from 33 ft. to 40 ft., and the length of bracket arms varying from 3 ft. 6 in. to 8 ft. A portion of the lighting is now completed and has given great satisfaction. It is hoped to have the whole scheme in operation for the beginning of the next lighting season.



Showing the new gas lighting at St. Helens, where a loan of £5,597 for improved public lighting has recently been granted.

One of the main streets of Leighton Buzzard, where greatly improved lighting has been introduced in accordance with a recent ten-year contract.

An interesting feature of the scheme is that the whole of the surface of this road is being relaid in varying road materials. A good opportunity of comparison of their merits in assisting good silhouette vision will, therefore, be provided.

Tewkesbury.

A third Ministry of Transport grant relates to the gas lighting of 2.7 miles of the Exeter—Leeds trunk road (A.38) from Gubshill to Mythe Hill. The Ministry has now agreed in regard to the specification with the Gloucestershire County Council, as its delegated authority, and the Tewkesbury Borough Council as the lighting authority. The installation, which will be carried out by the Cheltenham and District Gas Company, will consist of eighty-two 12-light gas lamps mounted on concrete columns at a height of 25 ft. The lamps will be sited strictly in accordance with the Ministry of Transport Committee's report and will be staggered, except round bends. The new five-year contract, which will come into force in September next, will also involve the erection and substitution of certain other lamps.

Leighton Buzzard.

A ten years' agreement for the lighting of Leighton Buzzard provides for the installation of fifteen 12-light gas lamps mounted 25 ft. high and 150 ft. apart, in the High-street and Market-square. Twenty-four similar lamps will light two other busy thoroughfares. The above lighting is of Group "A" standard, but gas lighting up to Group "B" standard will also be furnished in various subsidiary roads. The illustration at the top of the page shows the effect of the new lighting, which is considered to be a great improvement.

Our other illustration relates to the lighting of St. Helens, which formed the subject of a note in our last issue. It will be recalled that a loan of £5,597 has been sanctioned by the Ministry of Health for these improvements, which involve the ultimate installation of 521 new lamps.

A final instance of recent improvements in gas lighting may be mentioned—those carried out in Colne during the past year. All lamps are now fitted with automatic controllers, and gas is now installed throughout the main shopping streets of the town. The new lamps, each utilising fifteen No. 2 mantles, are mounted 25 ft. high with a spacing of 100 ft. Other similar lamps, but using twelve mantles, are erected on approaches. There are in all about 1,300 gas lamps in the Colne area of supply.

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Public Lighting by Electricity

Bootle.—A street lighting scheme recently switched on at Bootle is an interesting example of cut-off lighting correctly laid out and spaced. The Southport-road at Bootle is part of a new double-carriageway thoroughfare which, when completed, will link Liverpool with Southport. Steel columns are mounted on the broad central reservation separating the carriageways. The lanterns are mounted 25 ft. high on long brackets suspended over the middle of each road, with overhead wiring. The lanterns are of the open cut-off type and house sodium lamps, the cut-off occurring between 75° and 80°. The lamps are controlled by time switches, except on the roundabout, where a photo-electric cell performs the switching. The installation was carried out under the supervision of Mr. W. A. Harrison, borough engineer and surveyor.

Broadstairs.—The Council has adopted the Lighting Committee's recommedation to accept the whole of Thanet Electricity Supply Company's tender for the whole of the street lighting in the urban district as from April 1, 1940.

Burnley.—Proposals for improving the lighting of 'bus routes lying off main roads have been accepted. Part of Todmorden-road is to be lighted by sodium discharge lamps. A scheme for improving the lighting on the Stoops Estate is being prepared.

Gosport.—The Borough Council has decided that electric street lighting shall be used in the town for the next fifteen years, and has accepted the tender of the Portsmouth Electricity Department to this end. The annual cost will amount to £7,272.

Grimsby.—Tests are to be made shortly with a view to the installation of a centralised control system of street lighting. The Council is interested in this matter with a view to controlling all public lamps from the power station.

Hailsham, Sussex.—120 electric street lamps are to be provided at Willingdon, according to a recommendation approved by the Hailsham Rural District Council.

Hazel Grove.—Centralised remote control of street lighting has been approved by the U.D.C. The Council has also decided to provide 125 additional street lamps in the Woodford area at a cost of £1,500.

Heston and Isleworth.—Street lighting in Staines-road, between Barrack-road and the borough boundary, is to be improved. Twenty-seven lamp columns will be required, and tenders have been invited.

Holbeach.—By a renewed contract with the Boston and District Electric Supply Company, covering a period of five years, the wattage of lamps in the main streets is to be considerably increased, and a number of additional lamps are to be provided in the previously lighted portion of the Council's area.

Keynsham, Bristol.—The U.D.C. proposes to instal sodium street lighting on the trunk road between Broadmead and The Glen at a cost of £2,268.

Long Sutton.—The Council has renewed its contract with the Boston Company for a further period of five years, and has made arrangements for improved lighting at important road junctions.

Newark.—A scheme for relighting the principal main roads with sodium discharge lighting is estimated to cost £1,920, and the Council is asking the Minister of Transport to provide a grant towards this object.

Newmilns, Ayrshire.—At a cost of £1,333 the Town Council has decided to light all the streets in the town by electricity.

Selston.—The Parish Council has entered into a street lighting agreement under which all the streets in the area will be lighted by electricity from September, 1940.

Shildon, Co. Durham.—Following a series of visits of inspection to other towns, the Urban District Council has accepted a scheme proposed by the North-Eastern Electric Supply Company, Ltd., for mercury discharge lighting.

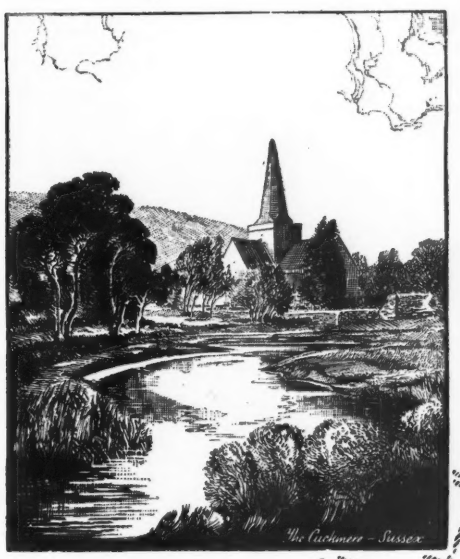
Sunderland.—The County Borough Council has now decided to instal a system of centralised street lighting control which will also be used for air raid sirens, calling of air raid wardens, firemen, or emergency services. Further application of the system will be applied to off-peak load control. The main control will be installed at the Electricity Works, Dunning-street, with additional press-button control to the office of the Chief Constable. This scheme is claimed to be the largest of its type yet installed in the country.

Swansea.—A scheme submitted by the electrical engineer for the reorganisation and improvement of the town's public lighting system is estimated to save £1,680 per annum. Seven men who will be displaced will be found employment elsewhere.

West Ham.—At a cost of £1,700, mercury discharge lighting is to be installed in High-street, Stratford, from Station-street to Bow-street.

Wolverton, Northants.—566 electric lamps are to be used for the lighting of Wolverton following the acceptance by the U.D.C. of the Northampton Electric Light Company's tender. The Council will enter into an agreement for a period of fifteen years.

Beautiful Waterways



The graceful outlines of the South Downs are reflected in this peaceful stream, which meanders gently at their foot. Such tranquility is a strange contrast to the rush of modern living.

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NOTES ON ILLUMINATING ENGINEERING ABROAD

(Specially Contributed—H. L. J.)

United States of America.

A new drying process by means of infra red radiation has recently been described in a contribution to the "General Electric Review" (U.S.A.). A lamp specially designed to emit near infra red radiation is described. It is pointed out that all glowing radiators, such as a normal tungsten lamp, the sun, etc., emit near infra red radiation—in the case of a tungsten lamp between 80-90 per cent. The new 250-w. tungsten drying lamp is designed to supply the form of energy which is the most effective for vaporising common solvents and washes. It thus contains those wavelengths which are most easily absorbed by the finish and some energy which will be transmitted by the surface of the liquid to be absorbed within the body of it. Different solvents and washes have their maximum absorption at various wavelengths. Certain lacquers have their greatest absorption in the visible and near-visible region of the spectrum. A drying device for such lacquers therefore will prove most effective if the major part of the energy is in that region. As the lacquer drys the volatile substance is removed leaving the pigment. The curing or setting of the film is a process of oxidation or polymerisation or both. Chemical change is usually produced by temperature and the energy reflection of the pigment itself becomes an important factor in the determination of a source for drying. It is desirable to have a source which delivers most of its energy in the wavelengths most suited for evaporation of the volatile material and which also produces energy to be used in the chemical change which takes place in curing. Many industrial drying processes consist merely in the removal of water, no chemical change being involved. Energy of a wavelength greater than 14,000°A. will be wholly absorbed as heat by an appreciable thickness of water. On the other hand, it is desirable to produce heat throughout the water film rather than at the surface alone to aid quicker evaporation. As all radiant heaters do supply some energy at wavelengths greater than 14,000°A. the colour temperature of the source will determine the penetration. In the case of a water film 1mm. thickness and a tungsten lamp 3,000°K. about 65 per cent of the energy from the lamp penetrated, whereas, in the case of an iron heater with a 1,000°K. colour temperature, about 3 per cent. only penetrates through the same thickness, the rest being absorbed. The drying lamp with a colour temperature of 2,500°K. represents the balance between absorption and penetration. It thus becomes highly applicable for removing moisture from pulp, felts, and other such materials of appreciable thickness when saturated with water. The lifetime of such a drying lamp is 10,000-20,000 hours, and its light output about one-third that of a conventional Mazda filament lamp of the same wattage. Two forms of reflector are available for different applications. In the case of spot-drying a strictly parabolic reflector is used. For the surface of such reflectors a high finish giving reflection properties for infra red radiation is desirable. The best of these is gold plating, although copper and silver plating are close to gold. Alzak, also, is well adapted, but chromium and aluminium are less efficient. The first large-scale use of infra red drying, on the lines set out above, was made in the works of the Ford Motor Company at Dearborn (Mich.). Tunnels banked by reflectors were constructed. Through these the car bodies passed at distances varying from 9 in. to 18 in. from the reflectors. The prime coat was dried in seven minutes, as compared with thirty minutes previously required with an oven. The finishing coats required slightly longer drying (eighty minutes in a steam oven or fourteen minutes in the lamp tunnel). Altogether some 30,000 such reflector units are now used by the Ford Motor Company

Holland.

A good example of overhead lighting. One of the assembly departments for radio receiver sets in the Philips works, at Eindhoven, Holland, which was visited by delegates to the recent I.I.C. gathering. Slowly moving conveyer-bands are used.

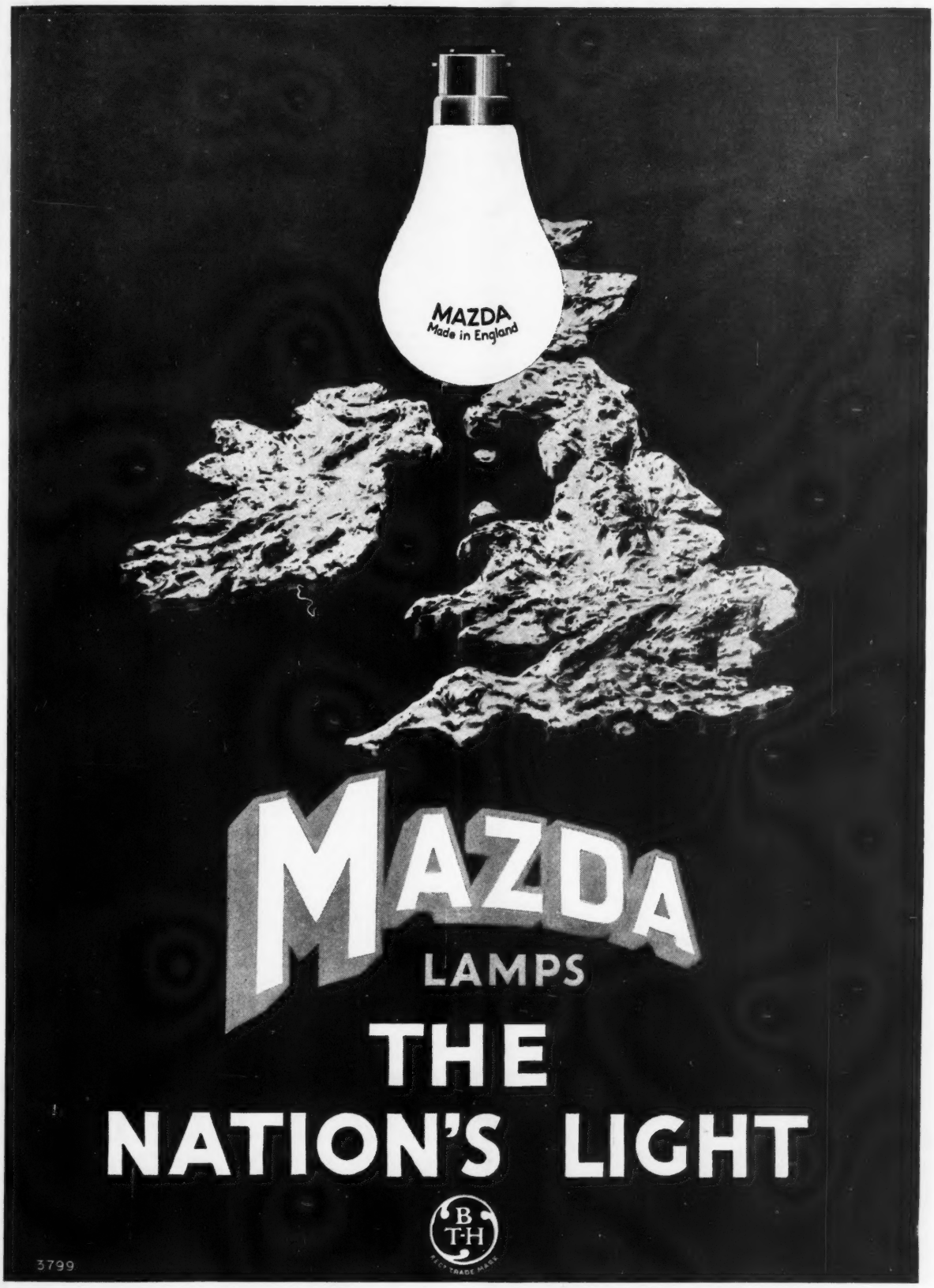
New Zealand.

The "New Zealand Engineer" reports that the New Zealand Standards Institute has recently issued a Code of Illumination Values prepared by its Illumination Committee. The Code consists of three parts: (1) "Light and Vision"; (2) "What Constitutes Good Lighting"; and (3) "Illumination Values." The last is divided into three sub-divisions: "Commercial Interiors," "Industrial Interiors," and "Domestic Lighting." Under these three headings recommended values of illumination are given for over eighty different interiors. These values have been arrived at after thorough examination of publications in other countries and after special investigation of actual values in use for domestic office and factory purposes under varying local conditions.

Switzerland.

The Grand National Exhibition at Zurich, taking place from May 6 to October 29, devotes much space to electrical and lighting development. Among the exhibits dealing with vision and light the most impressive is a reproduction of the human eye over 12 yards in diameter. Ten to twelve people can sit in the interior and follow demonstrations explaining the processes of vision and the influence of good and bad lighting. The demonstration is assisted by a small film projected on the retina of the artificial eye. In addition to this, much space had been devoted to lamp production, fittings principles, and light application.

The pavilion applying light in the most striking manner for decorative purposes is that of the Zurich Electricity Undertaking. In the centre of the front is a floodlit metal transmitter tower 50 yards high. The whole of the exterior of the pavilion is floodlit. A special feature is the arrangement at one point of light sources behind wooden lattice work painted white, while the wall is floodlit in blue. A small pond in front of the entrance is fed with water from an artificial waterfall about 10 yards high and floodlit by twenty 500-w. reflectors equipped with colour-changing devices which can be operated by visitors to the exhibition.



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Notes on Transactions (May, 1939)

NEWS: *The Greater New York Safety Council held its tenth Annual Convention from March 27 to 29.* Approximately 6,000 safety delegates attended. Much space was given to light as a factor in safety in the Press.—*The Edison Electric Institute held its seventh Annual Convention from June 6 to 8* in New York.—The "Better Light, Better Sight" programme for the forthcoming season will be linked up with the slogan of the New York World's Fair in the following way—"The Dawn of a New Day through Better Light Better Sight."—At a recent meeting of the Railway Engineering Association a resolution was adopted recommending *floodlighting of railway crossings* to prevent further railway accidents.—The I.E.S. Australia (Victoria) has started publication of a quarterly journal called "*I.E.S. Lighting Review*," commencing February this year.

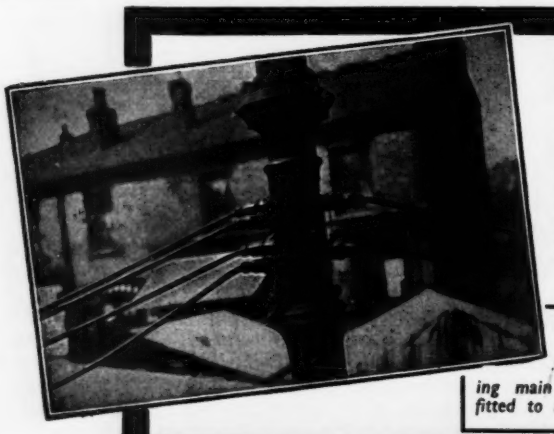
SUBJECTS OF PAPERS: "*Light as Decoration and as an Art*," by A. C. Schweizer, gives the views of an artist dealing with lighting in interior decoration. Lighting application is classified in four elements—lines, areas, masses, and spatial volumes: exemplifying these, he defines masses as being the illumination of successively projecting planes and convex curving surfaces. The reverse is luminous space volume created by illuminating concave or receding parts of a room. He strongly advocates designers studying the application of colours in relation to the impression to be created. He also discusses how light can be considered in terms of pure art, pointing out that "this is a century of light."

"*Spectral Analysis of Radiant Energy*," by C. E. Weitz and R. F. Cissell. The necessity of specifying proper application of colours produced by different light sources leads to the investigation of colour produced. To-day lighting is not applied for seeing purposes only, but for medical, decorative, etc., purposes as well. The illuminating engineer not only has to deal with the visibility spectrum but also with the ultra-violet and infra-red regions. The spectral energy distribution of different light sources and the reflection properties of different coloured surfaces are illustrated in diagrammatic form.

"*Effects of Impurities on Fluorescent Compounds*," by J. W. Marden and G. Meister, shows that extremely small percentages of certain elements materially reduce the light output of various fluorescent compounds. The theory of light production in fluorescent lamps is also discussed. Fluorescent lamps enable fair reproduction of colours to be combined with high luminous efficiency. Interesting data are given summarising in regard to the types of impurities which must be avoided in order to obtain the highest luminescent output of fluorescent powders.

"*Measurements of Effectiveness in Lighting Ping-Pong Tables*," by R. R. Whipple. A series of test-games were conducted in order to investigate acuity, speed, and fatigue under different lighting conditions to ascertain which method of lighting gives the best results. Low illumination from 0.5 ft.-c. upwards gave cause to great fatigue; considerably higher values of direct illumination resulted in blind spots, due to glare, where the ball was "lost." In the case of very high values of indirect lighting, ceiling brightness caused discomfort. An analysis of results showed that indirect lighting is superior to direct for this visual task, about 40 ft.-c. being the optimum.

H. L. J.



A "NIPHAN" market lighting installation showing main feeding sockets fitted to a lamp standard.

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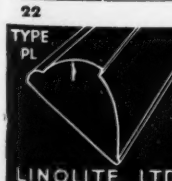

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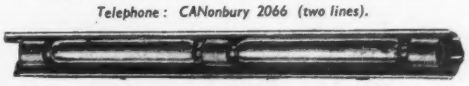
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N.B.—The numbers are those attached to individual entries in the Directory (See pp. 158—160)

Floodlighting at Harrogate

The accompanying illustration shows the floodlighting of the Grand Hotel, Harrogate, for which Siemens Sieray mercury vapour electric discharge lamps were used. 14.50 kW.

was allotted to the hotel front and side, and 9 kW. to the domes for which, however, tungsten filament lamps were found best. The Royal Hall Gardens were also floodlit by a mixture of tungsten lamps and mercury discharge lamps.

Public Lighting with Gas

A five-year agreement for the lighting of the Borough of New Windsor, where there are 530 lamps in use, has been approved by the Windsor Town Council. Improvements, involving the substitution of ninety five-light lamps for others of lower candle-power, are being made.

Glasgow Corporation Gas Department has installed sixteen new 18-ft. lamp standards, carrying six-light lamps, at a busy traffic roundabout.

In Coventry ninety-seven eight-light lamps have displaced others of lower candle-power.

In addition to Chipping Camden, other Gloucestershire places to adopt gas lighting include Broadway, Tewkesbury, and Winchcombe.

Other recent contracts include: Cononley, Yorks (seven years); Hadley, Shropshire (five years); Ramsey, Essex (seven years); Skipton, Yorks (seven years); Uttoxeter, Derby; Wellington, Salop (five years).

"Servants of the Public," an illustrated bulletin issued by the British Commercial Gas Association, emphasises the extent of the property owned by or administered by local authorities — including 150,000 miles of streets and thousands of schools, halls, libraries, museums, fire stations, parks, baths, etc. To-day over 800,000 public lamps are lighted by gas, apart from its manifold applications in buildings. Incidentally 40 per cent. of British gas undertakings are owned and operated by municipalities.

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